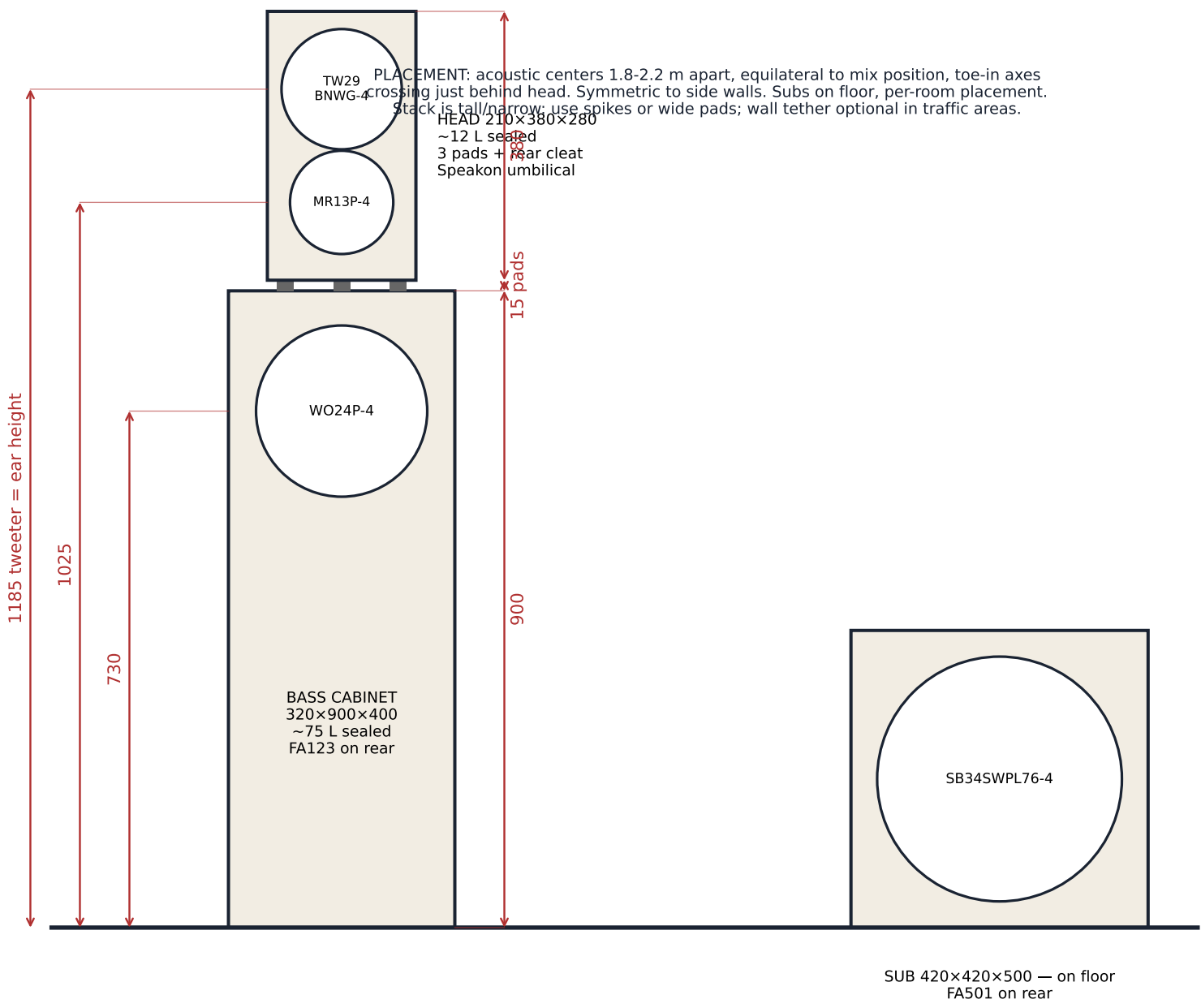
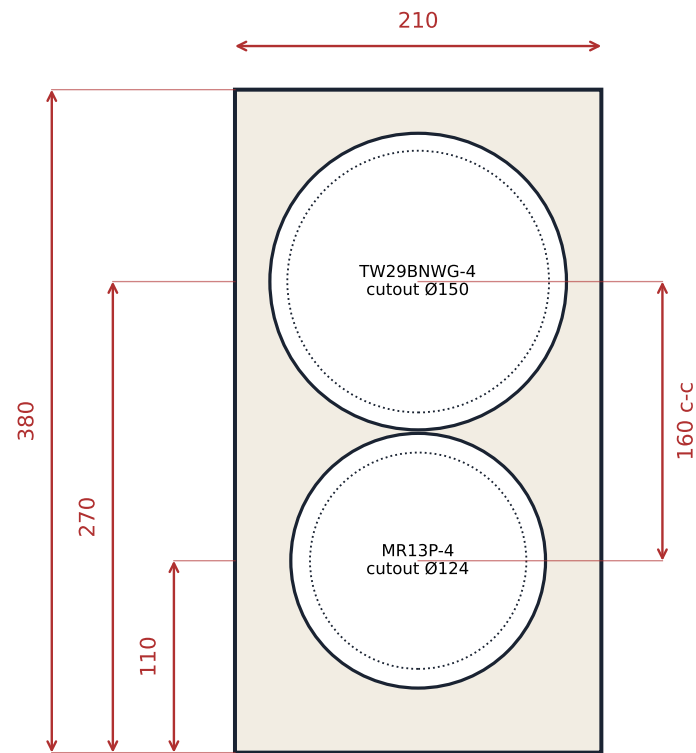
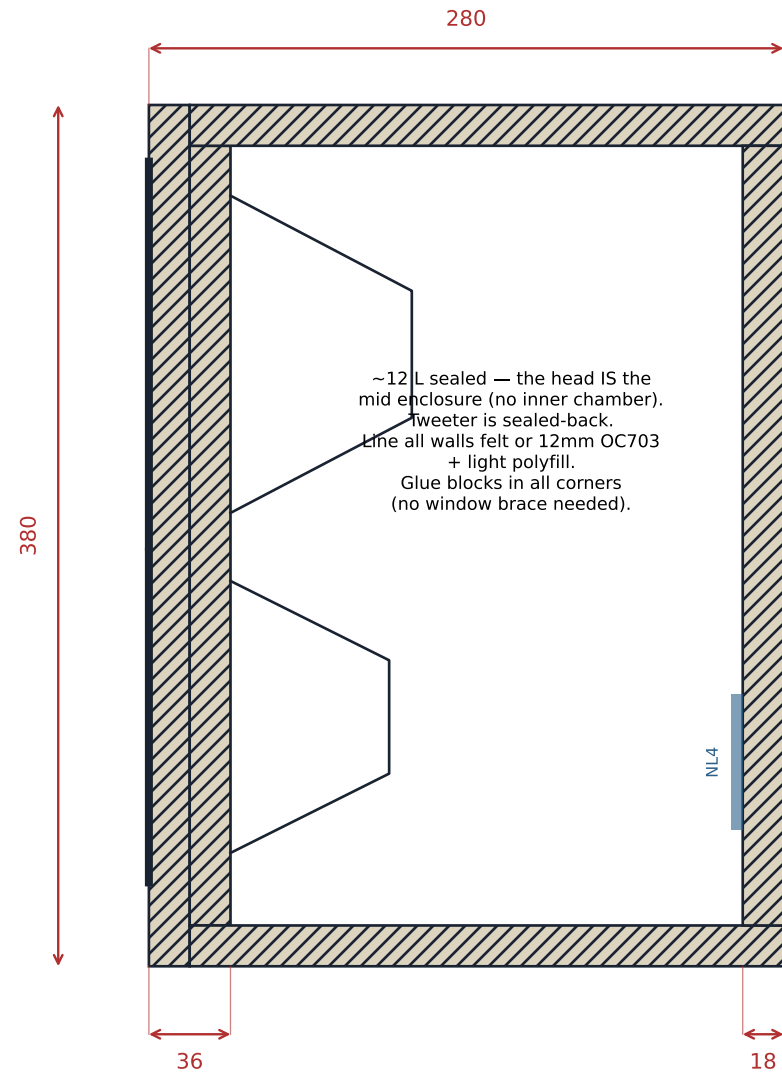


BUILD SCOPE (unit #1 of each = prototype)		DRIVERS / ELECTRONICS (9 systems)		est. USD
9 x	bass cabinet / stand	W024P-4, ~75 L sealed, FA123 inside		
9 x	head unit	MR13P-4 + TW29BNWG-4, ~12 L sealed		
9 x	subwoofer	SB34SWPL76-4, ~60 L sealed, FA501		
FOUR-WAY SYSTEM (DSP acoustic targets)		Satori W024P-4 woofer		x 9 2,295
sub	< 80 Hz LR4	FA501, LT 29Hz/0.49 -> 25Hz/0.577	Satori MR13P-4 midrange	x 9 2,160
woofer	80 - 250 Hz LR4	FA123 ch1 (125 W)	Satori TW29BNWG-4 tweeter	x 9 4,500
mid	250 - 2000 Hz LR4	FA123 ch2 (125 W)	Hypex FusionAmp FA123	x 9 4,950
tweeter	> 2.0 kHz LR4	FA123 ch3 (100 W)	SB34SWPL76-4 subwoofer driver	x 9 1,725
standalone preset: woofer LT 37Hz/0.56 -> 32Hz/0.60, no sub		Hypex FusionAmp FA501	x 9 5,400	
STACK GEOMETRY (floor to driver center)		miniDSP UMIK-1 measurement mic	x 1 110	
woofer	730 • mid 1025 • tweeter 1185 (seated ear height)	Speakon NL4 chassis pairs + cable	x 9 160	
woofer-mid separation	295 mm = 0.22 wavelength @ 250 Hz			
head on 3 decoupling pads (~15 mm) + rear locating cleat				
head umbilical: 4-pole Speakon from bass-cab top plate				
CABINET SYSTEM (all boxes)		LUMBER & CONSUMABLES		
18 mm Baltic birch • 36 mm laminated double baffle		18mm Baltic birch 5'x5' (1525x1525)	x 26 2,340	
flush-mounted drivers • 18-20 mm roundovers on verticals		24 sheets required by layouts (sheets 8-9-10);		
full-width window braces • amp cutouts per Hypex drawings		+2 spare for jigs / test cuts / mistakes		
		damping: OC703/rockwool, polyfill, felt	260	
		inserts, screws, gasket tape (~200 positions)	300	
		wire, terminals, grommets, sorbothane pads, glue	220	
		SYSTEM TOTAL (before finish)	~ \$24,700	
Order all drivers + ONE FA123 + ONE FA501 first; template and prototype against real hardware before buying remaining amps and lumber. RE-VERIFY every cutout/rebate against physical drivers and Hypex mechanical drawings before routing.				



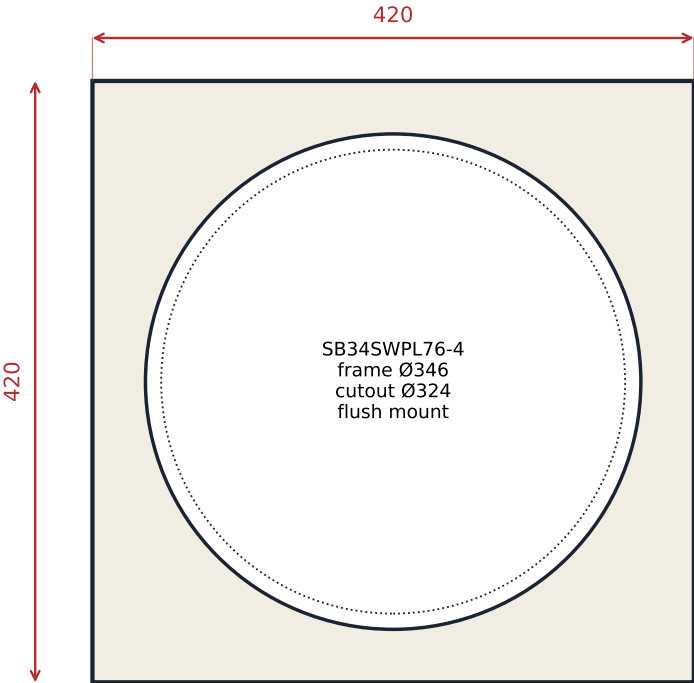


FRONT — 18-20mm roundover verticals

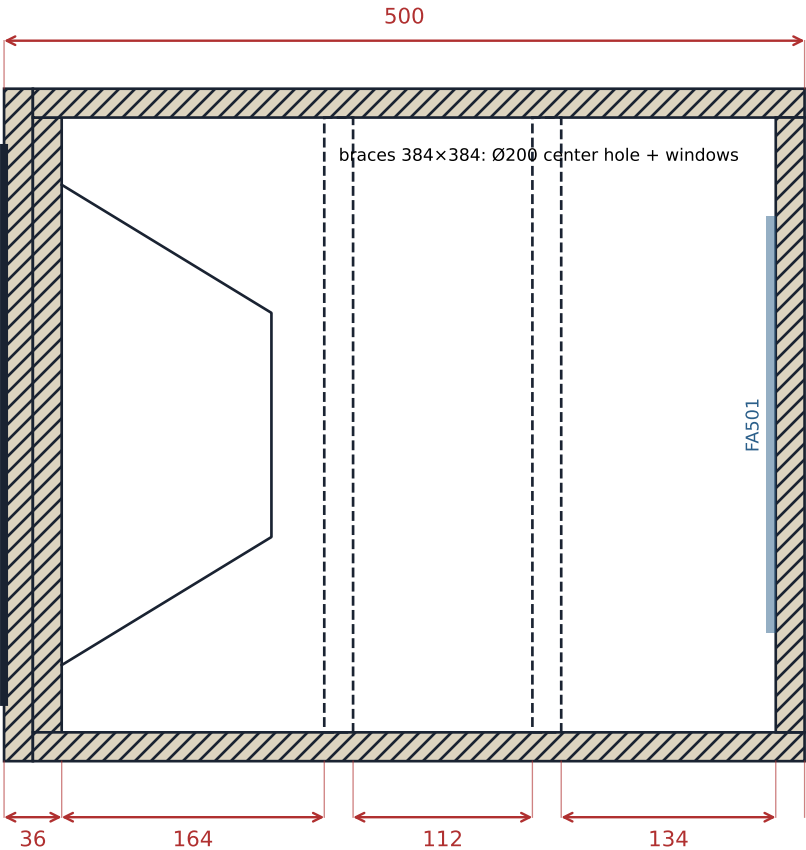


SECTION — rear cleat on underside locates onto bass-cab top

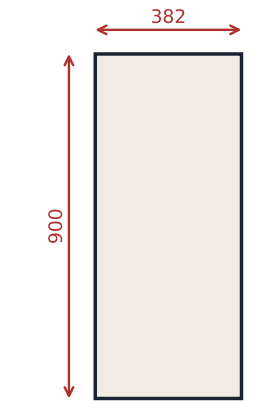




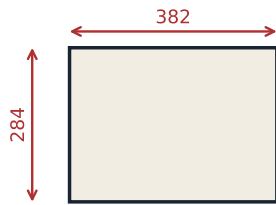
FRONT



SECTION — ~60 L net sealed • 25mm OC703 walls, no polyfill

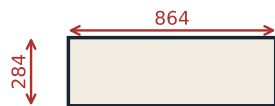


BA BASS SIDE
qty 18



BB BASS TOP/BTM
qty 18

top: Speakon hole +
cleat strike



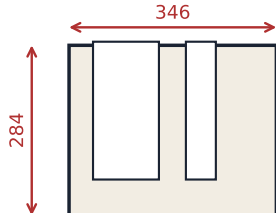
BC BASS BACK+INNER
qty 18

back: FA123 cutout
inner: Ø222



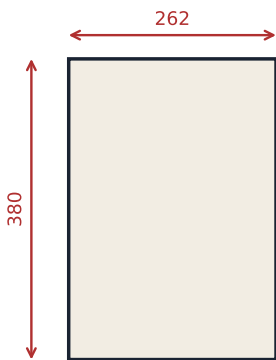
BE BASS OUTER BAFFLE
qty 9

Ø222 + rebate
round over verticals

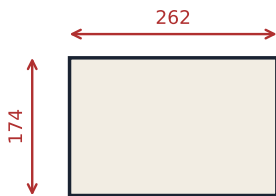


BF BASS BRACE
qty 27

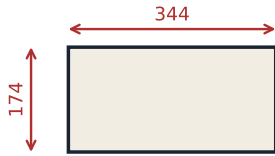
windowed, ≥55 rails



HA HEAD SIDE
qty 18

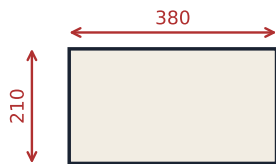


HB HEAD TOP/BTM
qty 18



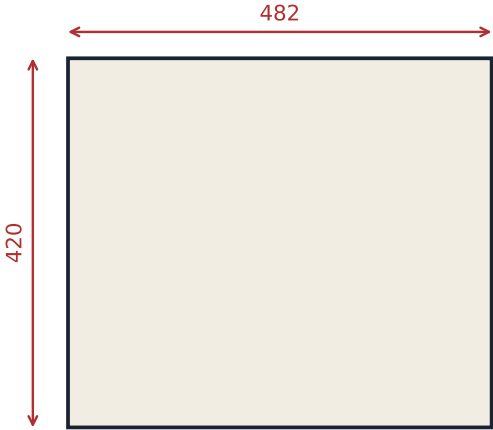
HC HEAD BACK+INNER
qty 18

back: NL4 hole
inner: Ø124/Ø150

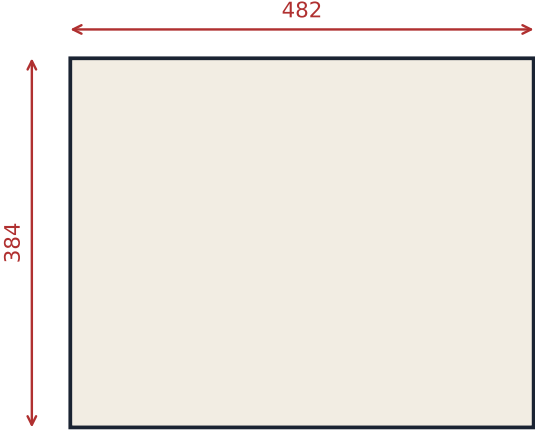


HE HEAD OUTER BAFFLE
qty 9

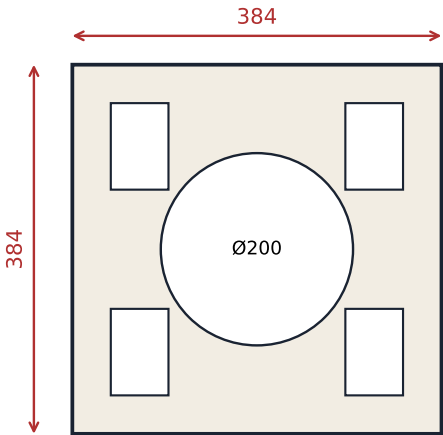
Ø124/Ø150 + rebates



J SUB SIDE — qty 18

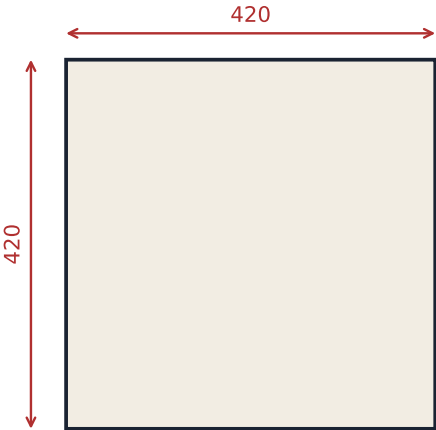


K SUB TOP/BOTTOM — qty 18



L/M/P BACK + INNER + BRACES — qty 36

9 backs: FA501 cutout
9 inner: Ø324
18 braces: Ø200 + windows



N SUB OUTER BAFFLE — qty 9

Ø324 + rebate Ø346

LAYOUT B1 — cut 6 sheets: 18x BA, 24x BB, 27+x BF

BB 284x382	BB 284x382	spare	BF 284x346 (trim)
BB 284x382	BB 284x382	BF (trim 346)	BF 284x346 (trim)
BA side 900x382	BA side 900x382	BA side 900x382	BF 284x346 (trim)
			BF 284x346 (trim)
			BF 284x346 (trim)

rip 3 @382 + 1 @367; cut BF only until you have 27 — rest stays spare stock

LAYOUT B2 — cut 4 sheets: 20x BC (2 sp), 20x BB (see note)

spare	spare	spare	spare	spare
BB 284x382	BB 284x382	BB 284x382	BB 284x382	BB 284x382
BC 284x864	BC 284x864	BC 284x864	BC 284x864	BC 284x864

rip 5 @284 — BB overproduced across B1+B2: stop at 18 total, keep rest as spares

LAYOUT B3 — cut 2 sheets: 8x BE + offcut HES

HE (trim 210)	spare	spare	spare
BE outer 320x900	BE outer 320x900	BE outer 320x900	BE outer 320x900

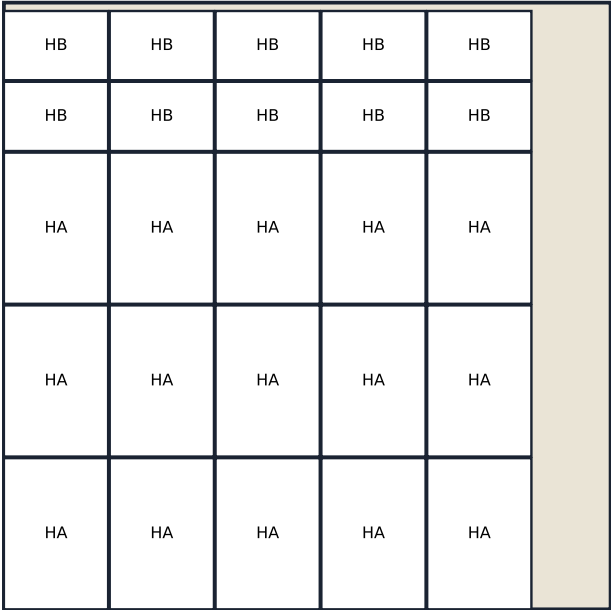
rip 4 @320; offcuts above BE yield HE blanks (trim to 210)

LAYOUT B4 — cut 1 sheet: 1x BE, 9x HE, 6x HA

BE outer 320x900	HE 210x380	HE 210x380	HE 210x380	HA 380x262	HA 380x262
	HE 210x380	HE 210x380	HE 210x380	HA 380x262	HA 380x262
	HE 210x380	HE 210x380	HE 210x380	HA 380x262	HA 380x262

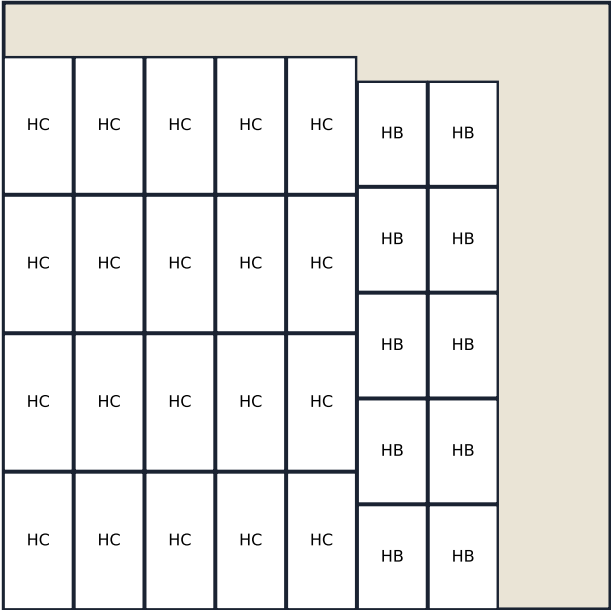
rip 1 @320, 3 @210, 2 @262

LAYOUT H1 — cut 1 sheet: 15× HA (12 needed), 10× HB



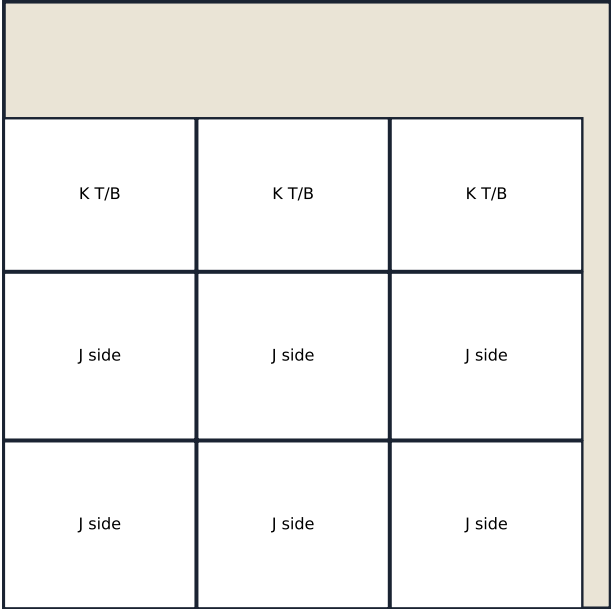
rip 5 @262

LAYOUT H2 — cut 1 sheet: 20× HC (2 sp), 10× HB (8 needed)



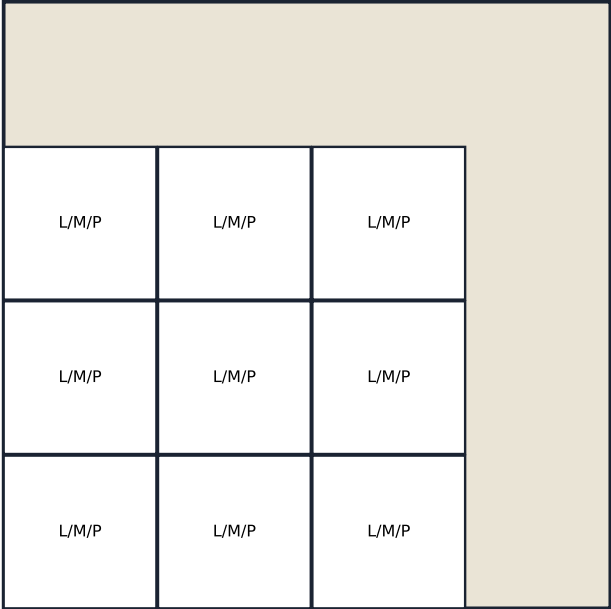
rip 7 @174 (5 for HC, 2 for HB); 8th strip = spare

LAYOUT S1 — cut 3 sheets: 18× J, 9× K



rip 3 @482

LAYOUTS S2 (×2), S3 (×3), S5 (×1) — see sheet 10 table



S2: 6K+3LMP & 3K+6LMP variants • S3: 9 LMP • S5: 9 N

PANEL SCHEDULE — 9 BASS CABS + 9 HEADS + 9 SUBS				~189 panels total
ID	PART	SIZE (mm)	QTY	SOURCE LAYOUT
BA	bass side	900 x 382	18	B1 (6 sheets, 3/sheet)
BB	bass top/bottom	284 x 382	18	B1 + B2 offcut positions (stop at 18)
BC	bass back + inner baffle	284 x 864	18	B2 (4 sheets; cuts 20, 2 spare)
BE	bass outer baffle	320 x 900	9	B3 (8) + B4 (1)
BF	bass window brace	284 x 346	27	B1 remainder columns + strip offcuts
HA	head side	380 x 262	18	B4 (6) + H1 (cuts 15; use 12)
HB	head top/bottom	174 x 262	18	H1 (10) + H2 (8)
HC	head back + inner baffle	174 x 344	18	H2 (cuts 20; 2 spare)
HE	head outer baffle	210 x 380	9	B4 (9); B3 offcuts = extra blanks
J	sub side	420 x 482	18	S1 (3 sheets, 6/sheet)
K	sub top/bottom	384 x 482	18	S1 (9) + S2a (6) + S2b (3)
L/M/P	sub back + inner + braces	384 x 384	36	S2a (3) + S2b (6) + S3 x3 (27)
N	sub outer baffle	420 x 420	9	S5 (1 sheet, 3 strips @420)
SHEETS: bass 11 (B1x6 B2x4 B3x2 ... B4 shared) heads 2 subs 9 = 24 required ORDER 26 (two spare). Overall yield ~65% — generous spares are deliberate: offcuts become cauls, cleats, router-jig stock, glue blocks.				
PROTOTYPE FIRST-CUT ORDER (one complete system from 7 sheets — cut these first)				
1. B1 #1	→ 3 BA, 2 BB, BF stock	5. S1 #1	→ 6 J, 3 K	
2. B2 #1	→ 5 BC, 5 BB	6. S3 #1	→ 9 L/M/P	
3. B4	→ 1 BE, 9 HE, 6 HA	7. S5	→ 9 N (or 1 strip: 3 N)	
4. H2	→ HC + HB			
Build & measure prototype set (bass #1, head #1, sub #1) BEFORE cutting sheets 8-24.				
SHOP NOTES				
• One fence setting per rip width; one stop-block per crosscut length; label ID + unit number on edge grain at the saw.				
• Templates: Ø222, Ø124, Ø150, Ø324 cutouts + rebates; FA123, FA501, NL4, Speakon top-plate hole. Validate in scrap; verify vs physical drivers & Hypex drawings.				
• BB top panels: drill/seal Speakon pass-through + fix the head locating cleat strike.				
• BF braces: all three sit below the woofer basket (see sheet 4) — no relief needed.				

Batch Build Sequence & Four-Way DSP Reference

reference • all dims mm • 18mm Baltic birch

BATCH SEQUENCE

1. Cut the 7 prototype sheets (sheet 10 order).
2. Build all router templates; test in scrap.
3. PROTOTYPE: build bass #1, head #1, sub #1. Full measurement pass; freeze filter sets; note any fit corrections → red-line these drawings before batch cutting.
4. Cut remaining 17 sheets per layouts.
5. Rout ALL penetrations before assembly.
6. Assemble carcasses; braces; inner baffles; laminate outer baffles (cauls, full squeeze).
7. Roundovers, sand, finish — one batch.
8. Inserts, gaskets, damping, harnesses, Speakon pass-throughs, amps, drivers.
9. Bench-verify channel-to-driver mapping at low level on every unit BEFORE full signal.
10. Clone prototype filter sets to all units; spot-check each vs reference curve.
11. Per-room: place stacks + 2 subs, level/delay align subs, cuts-only PEQ below 250 Hz.

THE ONE-SYSTEM RULE: all acoustics on system #1; units 2-9 are manufacturing. >1 dB deviation from the reference curve = leak / wiring / gasket, not filters.

FOUR-WAY DSP (Hypex Filter Design)

-- starting values; finals from measurement --

FA501 (sub):

LP 80 Hz LR4 • LT 29/0.49 → 25/0.577
HP 15 Hz BW2 • limiter @ 300 W

FA123 ch1 (woofer 80-250 Hz):

HP 80 Hz LR4 (with-sub preset)
LP 250 Hz LR4
standalone preset: LT 37/0.56 → 32/0.60
+ HP 18 Hz BW2, no sub

FA123 ch2 (mid): HP 250 LR4 / LP 2.0k LR4

FA123 ch3 (twtr): HP 2.0k LR4, -7..-9 dB

DELAYS: measure head-vs-woofer arrival per the invert-null method at 250 Hz; store in FA123. Head sits on pads — re-verify after any head reposition. Sub delay per room.

PLACEMENT: stacks 1.8-2.2 m apart, equilateral to mix position; symmetric to side walls; subs asymmetric (front-center + side midpoint is a good start), aligned at mix position.